

# ABSTRACT

For a high-temperature steam electrolysis apparatus in which a solid oxide electrolyte membrane is used, a reducing gas is supplied to the anode side, steam is supplied to the cathode side, and oxygen ions on the anode side are reacted with the reducing gas so as to produce an oxygen ion concentration gradient and thus reduce the electrolysis voltage, by studying the thermal balance inside the electrolysis vessel, an optimum temperature for the supplied reducing gas and steam is discovered.

The present invention relates to a method of producing hydrogen by supplying steam to a cathode side and supplying a reducing gas to an anode side of a high-temperature steam electrolysis apparatus in which an electrolysis vessel is partitioned into the anode side and the cathode side using a solid oxide electrolyte membrane as a diaphragm, and carrying out steam electrolysis at high temperature, the hydrogen producing method characterized in that the reducing gas and the steam supplied into the electrolysis vessel are made to have a temperature in a range of 200 to 500°C.